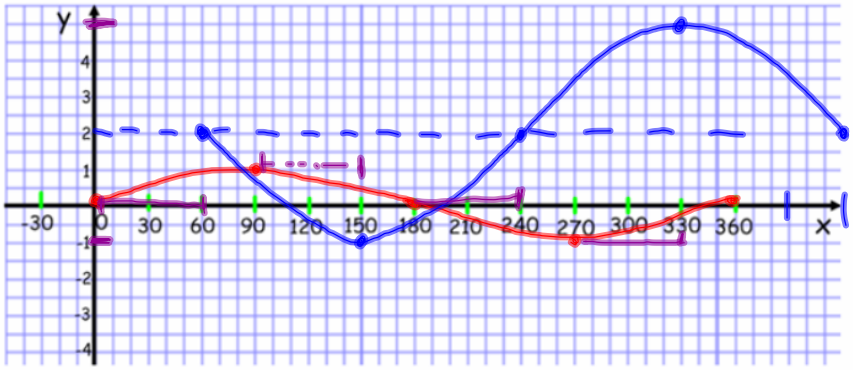
5.6 Sinusoidal Models

Warm-up:

1. . Sketch a graph of the following functions, for one full cycle

$$f(x) = -3\sin(x - 60°) + 2$$

equation of axis 1st



May 2-10:14 AM

Ex 1 The height of a basket on a water wheel at time t can be modelled by h(t)= sin(6t)°, where t is in seconds and h(t) is in meters.

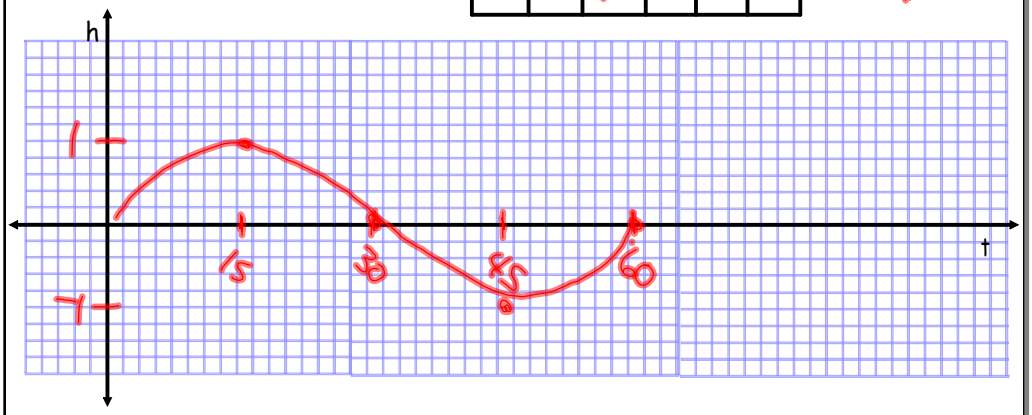
k (period)

$\frac{360°}{k}$

$\frac{360}{6} = 60$

a) The graph the function.

t	0	15	30	45	60
h	0	1	0	-1	0



Apr 26-7:50 AM

b) How long does it take the wheel to make a complete revolution? Explain how you know

60 sec. completes one full cycle in that time then it starts to repeat.

Could you find this value by looking at the equation?

Hint: it takes 360° to make a full revolution →

$y = \sin(6t)^\circ$

$= \frac{360^\circ}{6}$

$= 60$

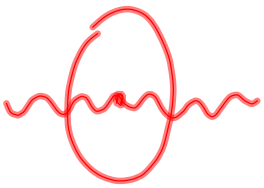
∴ it takes 60 secs

Now you have a "k" in your equation

c) What is the radius of the wheel? Explain how you know. 1m (amplitude)

d) Where is the centre of the wheel located relative to the water level? Explain how you know.

h=0 equation of the axis



Apr 26-7:50 AM

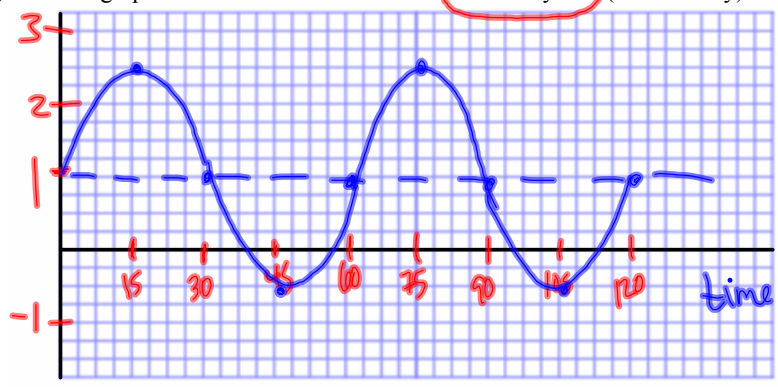
2. The height, *h(t)* in metres, of a basket on a water wheel above the water at time t, in seconds, can be modeled by $h(t) = 1.5\sin(6t^\circ) + 1$

equation of axis

Amplitude

period

a) Sketch a graph that models the situation for two full cycles. (label clearly)



$\frac{360}{6} = 60$

b) How long does it take for the wheel to make 1 complete revolution? 60 sec

c) What is the radius of the wheel? 1.5 m

d) How far has the basket traveled in 3 full cycles? $C = 2\pi r \times 3$

$= 2\pi(1.5) \times 3$

$= 28.27$

e) Where is the axle of the wheel located relative to water level? 1m above

May 2-10:15 AM

Assigned Work:

p 343 # 11, 12 ; p 349 # 5 ; p 352 # 9, 11-15

p 376 # 19, 20

Be sure to look at questions previously assigned

p 351 # 8, p 375 # 15, 16

4. Start Review

page 378-380

chapter 6 review and Practice Test

Nov 16-2:43 PM